

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (WITHDRAWN) A process for compression molding of a fine grained mixture of a resin and at least 50% filler material into a highly detailed molded part, comprising the steps of:
forming, at a first pressure, a preform of resin and filler mixture in a predetermined weight sufficient for molding the molded part, the cross sectional area of the preform being substantially less than the area of the part to be molded;
positioning the preform in a mold cavity at about the geometrical center of the product outline; and
molding the preform into the molded part by compressing the preform between mold segments defining the mold cavity in a molding machine which closes and applies pressure to the halves of the mold cavity to apply a second pressure to the molded part within a time interval sufficient to fluidize and flow the material to all parts of the mold cavity prior to the onset of curing of the resin in the mold.
2. (WITHDRAWN) The process of claim 1 wherein the first pressure is at least 400 psi.
3. (WITHDRAWN) The process of claim 1 wherein the second pressure is at least 300 tons.
4. (WITHDRAWN) The process of claim 1 wherein the time interval is within about 0.5 to 3 seconds.
5. (WITHDRAWN) The process of claim 1 wherein the filler material is graphite.
6. (WITHDRAWN) The process of claim 5 wherein the graphite comprises at least about

50% of the mixture by weight.

7. (WITHDRAWN) The process of claim 1 wherein the forming of the preform is performed on a separate press
8. (WITHDRAWN) The process of claim 1 wherein the preform is maintained in a climate controlled environment between the forming and the molding steps.
9. (WITHDRAWN) The process of claim 1 wherein the molding process also includes applying a vacuum to the mold cavity as it is closed and maintaining the vacuum in the mold cavity throughout the molding process.
10. (Currently Amended) A mold assembly comprising:
 - a first platen and mold cavity portion;
 - a second platen and mold cavity portion, the first and second mold cavity portions constructed and arranged for receiving in a mold cavity thereof;
 - a preform billet comprising a thermosetting resin and at least about 50% by weight of a graphite filler material, the preform billet having a cross-sectional area in the plane of the mold cavity portions which is only a fraction of the area of the mold cavity portions;
 - a press for performing a molding operation, wherein the press is capable of forcing the first and second platen and mold cavity portions together in an interfitting relationship, thereby compressing and flowing the preform billet into a molded plate with features therein defined by the first and second cavity portions; and
 - wherein the molded plate includes at least one diaphragm area having a thinner web of molded material therein which is readily removable from the molded plate when it is put in use.
11. (Previously Presented) The mold assembly of claim 10 wherein the first and second platens each also comprise a plurality of heating elements embedded therein, the heating elements constructed and arranged for maintaining a selected elevated temperature of the first and second cavity portions during the molding operation.

12. (Previously Presented) The mold assembly of claim 11 wherein temperature sensors are embedded in the first and second platens adjacent to at least one of the of the heating elements for providing a measurement of the platen temperature to temperature control circuitry driving heating elements adjacent to the temperature sensors.

13. (Previously Presented) The mold assembly of claim 12 wherein each temperature sensor is positioned adjacent at least one heating element and temperature control circuitry associated with it controls the temperature of those heating elements.

14. (Previously Amended) The mold assembly of claim 12 wherein the selected elevated temperature lies in a range between about 270 and 320 degrees Fahrenheit.

15. (Previously Presented) The mold assembly of claim 14 wherein the selected elevated temperature is maintained to within 5 to 10 degrees Fahrenheit across the molded part throughout the molding operation.

16. (Previously Presented) The mold assembly of claim 10 wherein the press opens the mold cavity by separating the mold cavity portions and at least one of the first and second cavity portions also comprises ejection devices positioned at various locations across the surface of the molded part, the ejection devices constructed and arranged for actuation during the opening of the cavity defined by the first and second cavity portions.

17. (Previously Presented) The mold assembly of claim 16 wherein both of the first and second cavity portions comprise ejection devices.

18. (Previously Presented) The mold assembly of claim 16 wherein the ejection devices comprise a plurality of ejector pins mounted on a separate ejector plate for movement relative to a cavity portion during actuation to apply an ejection force to the molded part as the mold cavity opens.

19. (Previously Presented) The mold assembly of claim 10 wherein both of the first and second cavity portions also comprise ejection devices at various locations across the surface of the diaphragm areas of the molded plate, the ejection devices constructed and arranged for actuation during the opening of the mold cavity.

20. (Previously Presented) The mold assembly of claim 10 wherein the first and second platen and mold cavity portions also comprise interfitting vacuum seals and the press also includes vacuum manifolds communicating to the mold cavity for establishing a partial vacuum between the first and second mold cavities during the molding operation.

21. (Previously Presented) The mold assembly of claim 20 wherein the partial vacuum is established in the mold cavity before the mold cavity portions are fully closed.

22. (Previously Presented) The mold assembly of claim 10 wherein the first and second cavity portions are formed from tool steel coated with a polyfluorotetraethylene material.

23. (Previously Presented) The mold assembly of claim 10 wherein outside edges of the first and second cavity portions when the mold cavity is fully closed are constructed and arranged for providing a parting line gap of about approximately .007 inches remains open around the perimeter of the part upon completion of the molding operation.

24. (Previously Presented) The mold assembly of claim 23 wherein the first and second cavity portions have a projecting land portion around substantially their entire circumference at the parting line, the land portions each being parallel to each other and the face of the molded part and separated from each other by about approximately .007 inches when the first and second cavity portions are in a closed position.

25. (Previously Presented) The mold assembly of claim 10 wherein the press is capable of applying a molding pressure of at least about 300 tons within about 0.5 to 3 seconds as the molding operation is performed.
26. (Currently Amended) A mold assembly comprising:
a first platen and mold cavity portion;
a second platen and mold cavity portion, the first and second mold cavity portions constructed and arranged for receiving in a mold cavity thereof;
a preform billet comprising a thermosetting resin and at least about 50% by weight of a graphite filler material, the billet having a limited cross-sectional area in the plane of a surfaces of the mold cavity portions relative to the area of the surfaces of the mold cavity portions;
the first and second mold cavity portions constructed and arranged for performing a molding operation, wherein the press is capable of forcing the first and second platen and mold cavity portions together in an interfitting relationship and compressing the preform ~~material~~ billet into a molded part with features therein defined by the first and second cavity portions.
27. (Previously Presented) The mold assembly of claim 26 wherein the first and second platens each also comprise a plurality of heating elements embedded therein constructed and arranged for maintaining a selected elevated temperature of the first and second cavity portions during the molding operation.
28. (Previously Presented) The mold assembly of claim 27 wherein the selected elevated temperature lies in a range between about 270 and 320 degrees Fahrenheit.
29. (Previously Presented) The mold assembly of claim 26 wherein the selected elevated temperature is maintained to within 5 to 10 degrees Fahrenheit across the molded part throughout the molding operation.

30. (Previously Presented) The mold assembly of claim 26 wherein the mold cavity portions are separable to open the mold and at least one of the first and second cavity portions also comprises ejection devices positioned at various locations across the surface of the molded part, the ejection devices constructed and arranged for actuation during the opening of the cavity defined by the first and second cavity portions.

31. (Previously Presented) The mold assembly of claim 30 wherein both of the first and second cavity portions comprise ejection devices.

32. (Previously Presented) The mold assembly of claim 30 wherein the ejection devices comprise a plurality of ejector pins mounted on a separate ejector plate for movement relative to a cavity portion during actuation to apply an ejection force to the molded part as the mold cavity opens.

33. (Previously Presented) The mold assembly of claim 26 wherein the molded part includes at least one diaphragm area having a thinner web of molded material therein which is readily removable from the molded part when it is put in use and wherein both of the first and second cavity portions also comprise ejection devices at various locations across the surface of the diaphragm areas of the molded part, the ejection devices constructed and arranged for actuation during the opening of the mold cavity.

34. (Previously Presented) The mold assembly of claim 26 wherein vacuum providing means are provided for establishing a partial vacuum between the first and second mold cavities during the molding operation.

35. (Previously Presented) The mold assembly of claim 26 wherein the first and second cavity portions are formed from tool steel coated with a polyfluorotetraethylene material..

36. (Previously Presented) The mold assembly of claim 26 wherein outside edges of the first and second cavity portions when the mold cavity is fully closed are constructed and arranged for providing a parting line gap of about approximately .007 inches remains open around the perimeter of the part upon completion of the molding operation.

37. (Previously Presented) The mold assembly of claim 36 wherein the first and second cavity portions have a projecting land portion around substantially their entire circumference at the parting line, the land portions each being parallel to each other and the face of the molded part and separated from each other by about approximately .007 inches when the first and second cavity portions are in a closed position.

38. (New) The mold assembly of claim 10 wherein the preform billet is generally cylindrical with its axis substantially perpendicular to the surface of the at least one of the first and second mold cavity portions.

39. (New) The mold assembly of claim 38 wherein the preform billet has a diameter of about approximately 3 inches.

40. (New) The mold assembly of claim 39 wherein the molded plate is about approximately 10 inches by 12 inches.

41. (New) The mold assembly of claim 26 wherein the shape of the preform billet is generally cylindrical with its axis substantially perpendicular to the surface of the at least one of the first and second mold cavity portions.

42. (New) The mold assembly of claim 41 wherein the preform billet has a diameter of about approximately 3 inches.